"THE SAPHENOUS-FEMORAL JUNCTION: KEY ROLE AS A PERFORATING VEIN".

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The same observations reported in the Anatomy Chapter of my book “Chirurgia delle vene e dei linfatici” (=Surgery of the veins and the lymphatics, Masson Editors, Milan-Italy, March 2003), about the collaterals of the sapheno-femoral junction, have prompted our School to spare the superior collateral vein: the superficial epigastric vein. This is a descending draining vessel, assisted by gravity (unlike the inferior collaterals). In case of portal hypertension, the spared superficial epigastric vein could drain it into the common femoral vein, thus saving its anatomical and haemodynamic function. This notion led us, although not unconditionally, only in the presence and the eventual competence of the femoral and saphenous terminal valve, to a “selective-haemodynamic sapheno-femoral junction ligation”, that saves from ligation and division the termination of the superficial epigastric vein into the common femoral vein. The resulting anterograde flow will provide some flow through the residual saphenous stump, preventing its thrombosis.

KEY WORDS: Epigastric vein-Haemodynamic- Selective crossectomy.

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This presentation is a preliminary study on sapheno-femoral junction which begins in 1987. The radical crossectomy, planned by Tavel and Facobson in 1904 and revised by Babecock, proposed the ligation and the cut of great saphenous with all its collaterals veins, close to the femoral vein.

The great number of recurrent varicoses veins, neo-cross and cavernomas reported by european scientific literature, induced us to an in-depth study about istology, topographic anatomy and, above all, about haemodynamic of the confluent veins of sapheno-femoral junction. These results led our school to modify traditional crossectomy into a more selective procedure taking into greater account the haemodynamic aspects involved. Therefore, we considered the saphenous-femoral junction as an independent structure of the perforating vein, useful to the out-flow of two distinct anatomical district: the lower limb and the inguin-abdominal one.

The method proposes to spare the superior collaterals: superficial epigastric vein and superficial circumflex-iliae vein (draining the inguin-abdominal district) performing the ligature and dissection of the great saphenous vein and its inferior collaterals (draining the lower limbs district); so obtaining a physiological out-flow of the superior collateral veins (Figure-1).

Figure 1 - Physiological out-flow of the superficial epigastric vein spared.

From an histological point of view, we remember that the deep veins are of the propulsive kind just like the perforating veins, the saphenous veins and superior collateral veins of great saphenous vein. These, in pathological conditions, show an increase in calibre and wall thickness due to compensatory hypertrophy of smooth muscle fibrocells, which usually characterizes the propulsive veins.
On the contrary, the superficial veins (apart from the saphenous veins, the epigastric superficial vein and superficial circumflex-iliac vein) show an almost total absence of muscular and elastic cells. Therefore, when they become varicoses, they have the typical characteristics of meiopragia.

Six years ago I had the opportunity to perform a lot of anatomic dissections on lower limbs of corpses at University Anatomy laboratory, in order to study the venous circulation of lower limbs and, above-all, the sapheno-femoral junction and its collateral veins (Figure-2).

![Figure 2- Sapheno-femoral junction and its collateral veins](image)

The first anatomical studies on these veins were done by Leonardo Da Vinci. In these drawings we can observe the importance, according to Leonardo, of the superior collaterals veins of the sapheno-femoral junction: the superficial circumflex-iliac vein that, passing along iliac crest, drains the trochanteric region and part of the abdominal wall veins, often connected with the superficial epigastric vein.

This vein originates from the anastomosis between the paraombelical veins-net (which flow into the portal vein trough Burrows vein) and the descending branches of the inferior epigastric vein, that it’s connected to the subcutaneous net of abdominal veins (Figure-3).

![Figure 3- Descending out-flow canal from portal vein system](image)

Therefore this vein is a real descending out-flow canal which communicates with portal vein system: in case of obesity or portal hypertension (whatever the cause) the venous circulation may invert its direction and allow part of hepatic blood to flow in to superficial vein net. Therefore the epatic blood may reach the inferior vena cava at first crossing the superficial epigastric vein and, then, to the femoral and iliac vein: this is the dramatically key role of the superficial epigastric vein.

From an histological point of view, the “superior collaterals” of the sapheno-femoral junction have the the typical characteristics of the propulsive veins: in their histological and anatomical destiny they have the possibility to make their circumference expand gradually, increasing up to 10 times in pathological conditions.

On the contrary, the inferior collaterals of the sapheno-femoral junction do not have smooth-muscle fibrocells and show an antigravitational flow: for this reason too, they may become varicoses. Thanks to the Duplex we can observe, that the superficial epigastric vein is often indipendent of the great saphenous vein in its femoral junction and precedes the saphenic out-flow.

Over twenty years of these observations, led us to carry-out 1536 selective crossectomies, sparing the superficial epigastric vein with its femoral junction. This allows a wash out of the residual stump, preventing its thrombosis.

This procedure has reduced the developement of recurrent varicose veins, neo-cross and cavernomas in varicose primary patients.

We observed, moreover, a total lack of caput-medusae in obeses or hepatothptic patients.

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